133 of Kars and flows north into the Kartalian plain. After turning east through Gori and Tiflis it follows a south-easterly course to the Caspian, which it enters by three mouths. During the months of March, April, and May it is flooded, and inundates the surrounding country at some points to a width of 3 miles. Its chief tributaries are the Alazan on the left bank and the Aras on the right.

The *Aras* (500 miles) rises in Turkish territory, entering Transcaucasia between the villages of Khorasan and Karakurt. It flows east till it is joined on the left bank by the Arpa Chai, passing through the Erivan plateau, and then takes a wide bend towards the south past Nakhichevan as far as Julfa, after which it turns east to Ordubad and then north-east, finally discharging into the Kura. The current is very rapid in the upper course, and also between Julfa and Ordubad, but is moderate from Erivan as far as Nakhichevan. There are many islands in the lower reaches.

In the Russian Armenian Highlands are the only important lakes in Transcaucasia: Gokcha, 540 square miles, at a height of 6,340 ft.; Chaldir, 33 square miles, at a height of 6,520 ft.; and several smaller ones, all at heights between 6,500 and 7,000 ft.

(3) Climate

● 132 It is possible to divide Transcaucasia into three climatic areas: the Black Sea basin, the Caspian basin, and the Armenian Highlands.

West of the Suram Mountains, which form a dividing line between the Black Sea and Caspian basins, the atmosphere is moist and temperatures are moderate. The winter is mild, and, though snow falls, it rarely lies; the summer is hot and conditions are unhealthy on the Black Sea littoral. The annual rainfall averages from 60 to 80 inches. Periodical changes of wind are not uncommon, and cause sudden alterations of temperature. The effect of the climate on the country is noticeable;

	Locality.	Height in feet above sea level.	Mean Temperature in Degrees Fahrenheit.				Annual Rainfall in inches.	Prevailing Wind.		
			Jan.	May.	August.	Annual.		Winter.	Spring.	Summer.
Black Sea Basin	Batum	173	41	61	78	58	80·15	S.E.	—	N.W.
	Kutais	480	40	66	76	58	44·35	N.E.	N. by E.	W.N.W.
	Poti	10	43	62	76	58	65·30	S.E.	S.S.W.	S.W. by N.
	Sukhum	30	44	64	76	59	40·47	S.E.	S.W.	S.W.
Caspian Sea Basin	Baku	53	38	64	78	58	12·86	—	N.N.W.	N. by E.
	Lenkoran	65	37	66	77	58	—	N.W.	S.E.	S.E.
	Tiflis	1,343	33	63	76	55	18·44	N.E.	N. by W.	N.W.
	Temir Khan Shura (Daghestan)	1,510	26	—	73	51	17 to 21	S.W.	—	N.W.
Armenian Highlands	Alexandropol	5,090	13	53	66	42	13·40	—	N.E. by N.	N.E.
	Aralikh	2,606	20	65	79	53	6·08	—	N.N.W.	N.W. by N.
	Erivan	3,174	13	69	80	53	—	—	S.E.	N.E.
	Shusha	3,870	33	56	66	49	20·79	—	—	S.E.

3: Anonymous U-4 (no date) 1920 RH1 Caucasia RH1

132 vegetation is abundant, and near the sea semi-tropical in its luxuriance.

East of the Suram Mountains the climate is dry, with extremes of heat and cold. The summer is oppressively hot, particularly in the Kura valley. The Caspian basin, as a whole, suffers from drought, and in the Baku district violent sand and dust storms are common.

The climate in the Armenian Highlands shows characteristics similar to those of the two areas above described. At Alexandropol snow lies till the middle of April, spring lasts a fortnight, and the summer parches the country to the condition of a desert. The Aras valley has a somewhat less rigorous climate.

Recent climatic statistics for the three areas are shown in the table given on p. 7.

(4) Sanitary Conditions

[144] 164 Sanitation in anything like the modern sense of the word is practically unknown in Transcaucasia. Medical facilities, except in the larger towns, are practically non-existent. Constant epidemics of malaria are caused by the marshy conditions prevailing on the Black Sea coast, and in the valleys of the Rion, Aras, and Kura. Goitre and epilepsy are common among the natives of Svanetia. Leprosy occurs among the poorer classes of the Persian population. Elisavetopol is notorious for the so-called Sartian sickness, a kind of skin eruption.

(5) Race and Language

563 197 101 Of the numerous peoples represented in Caucasia, some belong to the white race, others to the Mongolian or yellow race.

I. The inhabitants who are of white race belong to the Indo-European, Semitic, or Caucasian families.

Indo-European Family.—Everywhere there are *Russian* officials, merchants, and soldiers, and there are also large numbers of peasants, who are either voluntary colonists or religious exiles from European Russia. They speak both Great and Little Russian.

3: Anonymous U-4 (no date) 1920 RH1 Caucasia RH1
CISCAUCASIA

133 kaz, on the high plains to the north of the Caucasus. The Terek bends first north-west, then east, past Mozdok (altitude 441 ft.) and Kislyar (29 ft. below sea-level), and enters the Caspian Sea by several branches. The delta is sixty miles wide, and the river forms large sand-banks opposite its mouths. It does not freeze every year. The chief tributary is the Zunzha, all the others being mere mountain torrents.

On the left bank of the lower river are great steppes, while shifting sand-dunes cover an extensive tract from Mozdok northwards; near the delta is the depression of Kislyar, covered with impenetrable salt morasses, while to the right of the Terek is fertile country.

The *Kuma* (about 400 miles) rises on the northern slope of the Caucasus, and flows by several branches through the sandy steppes towards the Caspian. At times of flood it reaches the sea, but at other seasons its channels disappear in the sandy steppes along the coast. Its tributaries are the Karamyk, Podkumka, and Buivola.

(3) Climate

132 The climate is continental, and in the winter the cold is severe.

Temperature.

	Mean Annual Temp.	*January (Mean).*	*July (Mean).*
Vladikavkaz (altitude 2,345 ft.)	47·7° F.	23° F.	69° F.
Stavropol (altitude 2,030 ft.)	47° F.	24° F.	79° F.
Pyatigorsk	48° F.	25° F.	71° F.

Annual Rainfall.

Terek Province

Mountainous districts	37 in.
Steppes	10 to 20 in.

Vladikavkaz

34·2 in., of which 25·8 in. falls between April and September.

3: Anonymous U-4 (no date) 1920 RH1 Caucasia RH1

In the 'black earth' steppes of Ciscaucasia the maximum rainfall is at the beginning of summer; on the eastern steppes, which extend along the Caspian Sea, the maximum is reached in March. 132

(4) Sanitary Conditions

The science of hygiene is unknown in Caucasian villages, and medical aid is absent or inaccessible in country districts. Malaria is the characteristic disease of Caucasia, but small-pox, scarlet fever, measles, dysentery, typhus, and pneumonia are prevalent and cause many deaths. 758 164

In the fashionable health resorts, such as Kislovodsk, Jelieznovodsk and Pyatigozsk, there are very up-to-date sanatoria established on the latest German lines, to which people come from all parts of Russia to take the waters and the cure. 529

(5) Race and Language

Russians form 34 per cent. of the people of Ciscaucasia, and in the Government of Stavropol amount to 90 per cent. In the Province of Kuban 109 per 1,000 are Cossacks; in Terek the proportion is 179 per 1,000. Tatars live in the east and south-east, where they form 19·3 per cent. of the inhabitants. The remainder consists of Kalmucks, Turcomans, Nogai-Tatars, Armenians, Georgians, Germans, Poles, &c. (See also p. 8.) 162

(6) Population

The population of the three Ciscaucasian provinces on January 1, 1913, was 5,470,600, distributed as follows:

	Rural Population.	*Urban Population.*	*Total.*
Kuban	2,667,000	244,800	2,911,800
Stavropol	1,232,400	79,700	1,312,100
Terek	1,015,100	231,600	1,246,700

Towns

Ekaterinodar (population in 1897, 65,697, now about 107,000), the capital of the Province of Kuban, is 161 361

5: Allen H-4 (no date) 1923 RH1 Caucasia RHI

B. ECONOMICS

IX

THE RESOURCES OF GEORGIA, THE CAUCASUS AND AZERBAIJAN

133 *Climatic Conditions.*—The general characteristics of the geography of the Caucasus and Transcaucasia have already been indicated.[1] To the west are the Euxine, to the east the Caspian depressions. To the north the solid wall of the Caucasian Range, stretching for 650 miles west-north-west to east-south-east, separates the northern steppe from the southern river-valleys. The comparatively low range of the Suram Mountains running from north to south connects the Caucasus with the Pontic or Armenian system and separates the head-waters of the Rion and the Kur. And to the south-east an advanced bastion of the Armenian Mountains dominates the middle reaches of the Kur Valley.

● 132 Transcaucasia may be divided into three climatic areas. In the west the protection of the great Caucasian Range and of the lesser systems in the east and south has produced in the basin of the Rion a climate which is subtropical. The summers are oppressively hot, and the winters are mild and with little fall of snow. The heavy rains, the annual fall of which averages 60 to 80 inches, combined with the multitude of streams which find their way to the marshy Mingrelian coast, produce an atmosphere of extreme humidity. Hence, whilst the soil is fertile and sub-tropical, and fruits and vegetation flourish, the health of the inhabitants suffers, and malaria, with its consequent enervation of physique and *moral*, is prevalent. To the east, in the Kur Valley, the Suram Range breaks the force of rain-clouds drifting over from the Black Sea, while the parching winds of Central Asia blow across the Caspian and raise in the Baku region the most violent sand- and dust-storms. Kakhetia and Karthalinia are adequately

[1] Vide pp. 169–171.

5: Allen H-4 (no date) 1923 RH1 Caucasia RH1

watered by the streams falling south and west from the Central Caucasus and Daghestan; but the annual rainfall is low in comparison to that of the Mingrelian Plain, and at Baku registers an average of only 13 inches. The destructive measures of invaders and subsequent desiccation have further contributed to the aridity of the eastern region, and the grassy plains which once supported thousands of Mongol ponies have now degenerated in many parts into desert land. But as it is less fertile, so the Kur Valley is more healthy than that of the Rion. The atmosphere is dry, and if the summers are as hot they are not as humid as those of Mingrelia. In the winter extremes of cold are experienced, and snow lies in many parts of the Kur Valley. The third, or south-eastern, area, including Russian Armenia and Kara Bagh, suffers the violent contrasts of heat and cold of the Armenian Plateau. At Erivan and Alexandropol snow lies until April, while the short summers scorch all vegetation. The Araxes Valley suffers in a lesser degree from the same conditions.

Communications.—The chief commercial route in Transcaucasia is the Transcaucasian Railway. The main line runs north from Batum along the Black Sea coast to Nikolaevsk, whence it turns inland, crosses the Rion and at Samtredi joins a line coming from Poti. Thence it runs east-south-east to Gori and Tiflis, traversing the Suram by a tunnel. It follows the course of the Kur until it crosses the Poili bridge, and then runs south-east by Elisavetpol to Alyat on the Caspian Sea, where it turns north to Baku. The total length is 563 miles. The Railway Company further owns a pipe-line following the same route, which is capable of conveying 1,600,000 tons of oil per annum from Baku to Batum. From Tiflis another line runs south by Karakilissa to Alexandropol, whence it branches west to Kars and south-east to Erivan and Julfa. During the war, the Russians continued the Kars line to Sarikamish, whence a light railway connected it with Erzerum. Another light railway connects Julfa with Tabriz. Branch lines also connect the Transcaucasian line with Kutais and the Tkhvibuli coal-fields, with the Chiaturi manganese area, and with the popular health-resort at Borjom.

Until the collapse of Shamil Transcaucasia was almost without land communication with the North Caucasus, except by the Daryal Pass. The principal commercial communications between Transcaucasia and Russia still continue to be marine, on the Black Sea from Poti and Batum to the South Russian ports, on the Caspian from Baku to Astrakhan.

[See cat 116, p 201 ff; the date is 1859—Analyst]

103 Caucasians also call the Pontos the "Black Sea" (Georgian Šavi Zγva).

Later, in Arabic and Persian geographical and historical literature, forms of the name of these mountains such as Qabaq, Qabuq (?) appear, and a similar form Qāf or Qāp, becomes the general term for the Caucasus throughout the Near and Middle Eastern Islamic world (in Turkic Qāf daγlary, etc.), forms which have some slightly remote relationship with the old Iranian and Western term.

181 For a long time the Caucasus was, and
132 in a certain sense still is, a great divide between two rather different worlds: on the one hand, Trans-Caucasia, which is culturally Mediterranean and Near Eastern, and climatically arid and sub-tropical; and on the other, the North-Caucasian plains, a cultural no-man's land, the transitory roaming-grounds of nomadic peoples, and climatically belonging to the continental zone of the vast East European plains. The steppes of the northern
133 Caucasian triangle between Don-Volga and the
167 Caucasus have been, down to the last two centuries, the battlefields between ever-changing nomadic conquest groups, arriving one after the other in an almost unending sequence out of the high plains of Central and Eastern Asia, trying to force their way into the territories of the Persian or the Roman Empires, which had their outer defenses established in these plains. But even prior to those movements,

CLIMATE

• 132 Since the Caucasus reaches with its highest massifs into the zone of permanent glaciation, all climatic zones are represented, from the sub-tropical to the Arctic. Aside from the peculiar features of the high mountain ranges which can be called simply alpine, the Caucasus is located in a sub-tropical zone dominated by two sharply contrasting varieties of climate: humid-subtropical and continental. Although the Black Sea is a rather independent part of the Mediterranean, having been connected with it only during more recent geological epochs, and although on the average it is much cooler than the Mediterranean and situated a few degrees farther north, a large portion of the Black Sea area constitutes the extreme northeastern area of the Mediterranean climate zone. Here in the south of the large Black Sea basin the arid, continental portion of Asia-Minor plays, on a lesser level, the same role as the huge, arid northern mass of the African continent, situated in the south of the entire Mediterranean and far beyond it. As the northern quarter of the Black Sea is open to the influences of the vast Eurasian plains, with their continental climate, the Black Sea Basin is seasonally exposed to the influences of that climate. But in the eastern quarter,

132 the western ranges of the Great Caucasus serve as a strong protective wall against continental influences. Thus, the entire western half of the Great Caucasus and the extreme northwest of the Anti-Caucasus are open to maritime influences and exhibit a pecular humid-subtropical climate which can also be called subtropical-maritime.

The divide between the Black Sea maritime and the contin ental climates runs along the main crest-line of the Shifakly-Dagh, the eastern parallel range of the Pontic Range in the southwest. It then goes over onto the crestline of the eastern part of the Adjaro-Imeret'ian range, and follows along that of the Meskhi-Surami Mountains abutting against the crest-line of the southern main range of the Great Caucasus; then it turns sharply northwest and follows the crest-line to the end of the chains. With decreasing altitude of the main chains, the climatic frontier tends to become increasingly expandable towards the northeast of that line; at the same time, under continuing pressure of northeasterly winds, it tends to recede considerably behind that boundary line.

The Zone of Continental Climate

The entire territory south, southeast, east, and northeast of the divide belongs to the zone of continental climate, extending

132 from there and the central plains of Asia-Minor across most of the central and northern parts of the entire continent, as far east as the vicinity of the Pacific Ocean, in Southern Manchuria, and the Amur-Ussuri valleys.

In the area of the Caucasus, the continental climate can be characterized as sub-tropical, with the typical features of very low average precipitation and great vacillation between minimum and maximum temperatures during the day and night and in the course of the entire year. It should be noted that along with the rather high average temperatures which occur not only throughout the long summers, but during the daytime throughout the year, there are likewise, despite the latitude, rather low temperatures during the winter months and at night throughout the year. This holds true for the non-alpine territories of the area. It is self-evident that the average temperatures, which even on the plateaus of High Armenia are very high during the summer, descend during the winter, depressing the yearly average in proportion to the elevation.

The continental climatic features are mitigated to a certain degree by the basin of the Caspian, which, however, exerts an influence tending to increase humidity in some rather small areas along its southern and western coast. These areas therefore have the features of a humid sub-tropical climate.

• 132 This is true of the entire southern and southwestern Caspian coastal zone, which is a very narrow strip of land between the Alburz Mountains and the sea. Dagestan, again, has a typical semi-arid continental climate, and the central and northern parts of the Caspian Basin are exposed to northeast or southeast winds, of which the latter in particular have a humidity-resorbing power which in general far exceeds the evaporation from the sea.

The plains north of the Great Caucasus are under a stronger influence of the continental climate; they are the vast gateway for southeast winds, accompanied by semi-arid influences, up to the southeast, east, and at times the central parts of the East European plains. The large sheet of water represented by the Azov Sea is an area of Black Sea maritime influences, and easterly winds may also carry some humidity which is discharged along the northern foothills of the Great Caucasus; but beyond the mountainous region proper, i.e., in the North-Caucasian plains, the maritime influences are inferior to those of the continental climate. Precipitation of an annual average of 500 to 1000 mm. of rain (or snow) is observed all over the Great Caucasus, on altitudes from 2000 m. up in Dagestan, toward the northwestern extremity, Taman, and Kerch; its area includes that of the Stavropol' plateau which does not exceed the 1000 m. limit.

• 132 As a consequence of the great meteorological changes which have occurred during the past 30 to 50 years, the influences of continental climate from the southeast seem, at periods, to be strongly counteracted by those of the Atlantic maritime climate, which appears to be extending its power more and more across the East European plains in a southeasterly direction. But this does not mean that such influences make themselves felt in the climate of the area of the North-Caucasian (Black Sea-Caspian) plains.

Transitional Zones

Between these two sharply opposed climatic types are a number of transitional ones. As a variety of the sub-tropical climate the narrow strip of humid sub-tropical climate along the Alburz Mountains has been mentioned. The dry sub-tropical subdivision of the continental climate is typical of the entire southeastern part of that area of the Caucasus which is situated at an elevation not exceeding 750 m.; above that line the sub-tropical features are absent. We can therefore say that a dry continental climate is typical of the plateaus and valleys of High Armenia (and Karabakh). This latter climate is characterized by dry, hot summers and cold, snowy winters (with a maximum of cloudless days, however), thus corresponding to the climate

132 of northern and central Iran and Central Asia.

A more moderate form of this climate is found along the eastern section of the southern slopes of the Great Caucasus along the foot of the main ranges between the rivers Alazani and Aghry-Chai (the bottom of the valleys being slightly lower than 200 m.), and the mountains in the region between the cities of Nukha (about 500 m.) and Zakatali (540 m.). This more moderate climate is likewise predominant on the northeastern slopes of the Great Caucasus up to 1000 m. in the Kuba subsidence and in the Talysh Mountains at elevations up to 800 m. In this climate the number of hot months is smaller, a lower average annual temperature occurs, and there is a different precipitation cycle during the year. There are two periods of maximum precipitation, one in May-June and the other in September, an extremely valuable feature for plant growth; minimum precipitation occurs in January.

The Maritime Zone

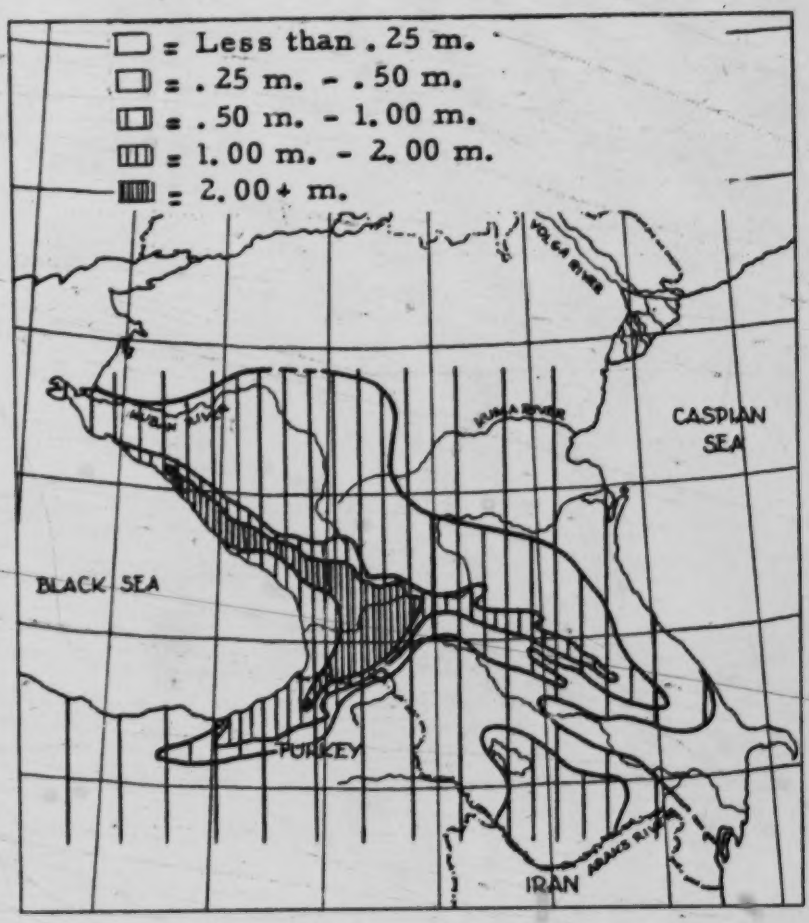
The entire area of the Black Sea maritime climate with its predominant southwest winds includes the entire eastern coastal curve of the Black Sea and the southwestern slopes of the western portion of the Great Caucasus, the entire triangle of Colchis-Imeret'ia, the western portion of the Adjaro-

132 Imeret'ian Mountains, and the northeastern range of the Pontic Mountains, including the valley of the Chorokh River. This area extends from about lat. 41° N. to lat. 44° N. However, as said above, the indirect influences of the maritime sub-tropical climate can be extended, during times of strong southwesterly winds, beyond the northwesternmost lower ranges of the Great Caucasus. An expansion of this climate beyond the Meskhi-Surami range is rare. There is relatively heavy precipitation along the southern slopes of the Great Caucasus from the northwestern end of the chain, near Novorossiysk, as far southeast as the region of Zakatali and Nukha, which have an annual average rainfall of 1000 to 2000 mm. (the farther southeast the lower the precipitation). This precipitation, east of the Meskhi-Surami divide, is due chiefly to southeast winds carrying Caspian humidity which is released at or near the crestline of the southern main range. While precipitation is seasonal in the continental climate zone, it is not limited to a particular season of the year in the Mediterranean-Black Sea area, although certain months in winter and summer have maximum precipitation.

17:Columbia U. S-4,5 1956 RH1 Caucasia RH1

●132

Precipitation in the Caucasus



Precipitation

• 132 The sketch map, page 114, shows the different areas with their respective density of average precipitation. It should be noted that the area of greatest density of precipitation does not include the westernmost part of Colchis, which is the Black Sea littoral proper, since the clouds release the greatest amount of water in the immediate vicinity of the higher ranges only. In addition, the area around Lake Sevan, within the dry continental area of Trans-Caucasia, has an annual average of 500-1000 mm. of precipitation; this is like the entire Great Caucasus from the 2000 m. contour line in the southeast to the end of the entire system in the northwest, with the inclusion of the Stavropol' plateau. This area, with its average precipitation of 500-1000 mm. per annum, may be considered a transitional one between Black Sea maritime and Central Asiatic continental climate. The greatest portion of Dagestan, with the exception of spurs and ridges at an elevation above the 2000 m. level, belongs to the continental climate. This gives Dagestan a unique appearance, so very different from that of the central and northwestern Caucasus. The preponderant features of Dagestan are those of aridity and therefore a lack of higher vegetation, especially forests. Forests are absent in many regions of the Mediterranean and

137

137 Oriental world, not only because of natural conditions, but especially because of deforestation wrought by man throughout all historical periods down to the beginning of this century; this is particularly true of the South-European peninsulas, Anatolia, and Iran. Similarly, Dagestan, in the regions exposed to the dry southeast winds, is bare of the exuberant vegetation and forests which are so typical of the central and northwestern ranges. In Dagestan wide differences in vegetation are found between the sun-exposed and the sun-protected slopes of valleys or mountains, as is typical of most mountainous regions of Central Asia. This is mirrored even in the nomenclature, as for example the Küngöj-Ala-Tau ("Sunny side Ala-Tau ['Bluish Mountain'] ") and the Terskäj-Ala-Tau ("Shady side Ala-Tau"), the two main ranges of the central Tiän-shan, north and south respectively of the Issik-Kul. The sun-exposed slopes are often steppe-like, while only on the sun-protected side of a mountain is there higher vegetation.

Cool and Cold Zones

132 137 Above the 1000 m. level, the temperatures begin to recede rapidly with increasing elevation, and the cooler climates begin. Up to 2000 m. we have a transitional, moderately cool climate with a preponderance of forest growth, mostly deciduous species of the European type such as beech, oak, hornbeam, etc., but without the evergreen brushwood and bushes found in the sub-tropical zones. Above

132 137 the 2000 m. limit the cold climate begins. Forests and higher vegetation disappear completely. It is the region of the sub-alpine and alpine meadows used by the people only as summer pastures since precipitation takes place for a great part of the year in the form of snow, and the snow cover lasts for a long period.

This area marks the transition to Arctic climate, which coincides with the extent of the region of permanent glaciation beyond the snow line between 3300 and 3800 m. altitude. Between the area of the alpine meadows and that of eternal snow, there is a region of lower vegetation, consisting for the most part of cryptogamic species, which may be likened to mountainous tundras.

Exterior Aspect of the Various Zones

Thus the different climatic zones dominating the Caucasus give the sub-regions distinctive features sharply contrasting with each other. The northern slopes of the entire northwestern and central Caucasus are well-forested. The southeastern part, on the other hand, where Dagestan is located, is absolutely un-European and has the prevailing features of Anatolia, Iran, or Central Asia. The eastern portion of the southern slopes of the Great Caucasus resembles the alpine portion of the Riviera, but the western portion,

-132 because of the great amount of precipitation
137 occurring in this area, is much richer in vegetation and increases the impression of sub-tropical conditions. The eastern portion of the southern declivity is in all respects more similar to the Riviera or the Lombardian slopes of the Alps, except for the absence of lakes. The opposite slopes of the Anti-Caucasus present essentially the same features - the sub-tropical portions of the Adjaro-Imeret'ian Mountains and, farther east, the northeastern boundary mountains of High Armenia, while the interior of High Armenia shares all typical features of the Anatolo-Iranian plains, of which it is the northeastern-most section. The peaks of High Armenia reach elevations as high as any in the Anatolo-Iranian system. The areas have the same latitudinal position. There is only one small area above the snow line; this is the volcanic massif of the Ararat. The Alagöz (Aragac) massif, on the other hand, is bare of snow during the summer. High Armenia differs from the rest of the Anatolo-Iranian plateaus by having a greater forested area, and thus more closely resembling the Great Caucasus in this respect.

Snow Line: Glaciation

.132 In the Great Caucasus, the snow boundary line starts in the northwest at a lower altitude than in the eastern part of the system. In general, the snow line, as in all alpine mountain systems, shows considerable variation due to the latitude, the exposure to sun and winds, the direction and force of the winds, the amount of precipitation, and the location of a given mountain or valley in relation to the main massif, etc. In the northwestern part of the Great Caucasus, the snow line starts at a level between 2900 and 3000 m. and steadily mounts, as the Caucasus stretches southeast, to a level between 3500 and 3600 m. Here, too, we must keep in mind that the snow line has been showing a tendency toward permanent recession during the past 50 years, as has been observed throughout the Eurasian continent. This gradual acclivity of the snow line from northwest to southeast is due only in part to the latitude (from lat. 44° N. to lat. 41° N.), the main reason being the greater amount of precipitation within the zone of the Black Sea-maritime climate all along the southern slopes of the main ranges, as mentioned above. An additional reason is the strong effect of the hot Caucasian summers coupled with a minimum of humidity in the air in the section east of the Meskhi-Surami range. For this reason, the snow line is dis-

•132 proportionately higher along the southern slopes of the eastern portion of the Caucasus. Similarly, a considerably smaller amount of precipitation occurs on the northern slopes of the system, with the result that the snow line is higher all along that area, and this in spite of the fact that the sunrays hit the northern declivity at a much more oblique angle. There the snow line starts at an elevation of about 3300 to 3400 m. and ends at a level of 3900 to 4000 m. in Dagestan. (If we compare the elevation of the Caucasian snow line to that of the Pyrenees, we find the former to be 600 m. higher on the average, even though the Pyrenees are located on the same latitude as the Caucasus. The smaller continental portion of the Iberian Peninsula, in the immediate vicinity of the Alantic Ocean, cannot absorb as much humidity as the plateaus of Asia-Minor and Iran, in the immediate vicinity of the Caucasus.) It is true that northeast winds carry a certain degree of humidity towards the Caucasus, but this humidity is discharged right in the foothills of the system. These circumstances account for a difference of about 400 m. between the northern and the southern snow lines. Proportionately higher still is the snow line in the Anti-Caucasus system, where it is found at an elevation of 4400 to 4500 m. on the northwestern, less steep slopes of the Great Ararat - due to the extremely dry climate and the high summer temperatures of the surrounding plateaus. A few

-132 A few
*133 individual narrow, pointed ends of névés and glaciers reach far down into protected places for more than 1000 m. One mightly glacier descends in the north into the crevasse of St. James Valley to an elevation of about 2600 m. No other peaks of the various Anti-Caucasus systems, even that of the Alagoz, reach into the zone of Arctic climate, and it is therefore one of the distinctive features of the Anti-Caucasus that it is without glacier
132 formations. In early September 1950 while flying over the southern peaks of the range connecting the Anti-Caucasus with the Armenian Tauros and the Zagros between Lakes Urmia and Van, this writer found a minimum of snow even on such a massif as the Djilu-Dagh (4580 m.), while old snow on massifs of lesser elevation was preserved only in ravines and crevasses between spurs projecting in a northerly direction. Very similar was the aspect of the towering cone of Mt. Demavend (5604 m.) in the Alburz during the months of July and late August. However, since the flight was along its southern precipice only, at an altitude lower than the peak, the condition of its northern declivity could not be observed.

In the Great Caucasus the chains permanently covered with snow are those situated between Mts. Oshten and Fisht in the northwest, and Mt. Kazbek in the center, covering a distance of only 420 km., i.e., roughly one-third of the extent of the entire system. East

-132 of Mt. Kazbek, only isolated snow-covered massifs are found; the southeasternmost is the Shah-Dagh and Bazar-düzü massif.

*133 There are proportionately fewer névés in the Caucasus than in the Alps, and moreover, the névés are less extensive and smaller in volume. This is the reason for the smaller number of glaciers in the Caucasus. The greatest homogeneous area of glaciation is that of the Elbrus massif, which is connected with that of the Adai-Khokh massif by an unbroken line of névés and glaciers. This part of the central ranges of the Caucasus, with its distribution of névés and glaciers, is well represented on a special map at the end of the second volume of Freshfield's work; all the names of peaks, passes (both with their elevations), and glaciers as well are given. (With regard to nomenclature, however, it is regrettable that the transcription used is not uniform, so that it is not possible to establish the correct form of a given name without knowing the language in question [which is often not sufficient, either, since we are dealing with proper names]; endless checking in other sources therefore becomes necessary.)

East of Mt. Elbrus is the névé and glacier system of the Ushba-Djailyk-Bashy-Tiktengen triangle, from which the northern rivers Baksan and Chegem, and the southern river Ingur, receive their source waters. Farther to the east is the smaller area

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CLIMATOLOGICAL CHART

Place and Clime-Zone	Position (Lat. N. Long. E.)	Elevation in m.	Average Temperature (centigrade) Jan.	July	Annual	Precipitation (annual) in cm.
Novorossiysk (maritime)	44°40' N 37°45' E	4	+1°	+24°	13.4°	76.2
P'ot'i (maritime)	42°40' N 41°40' E	6	+3.7°	+23°	14.7°	176.0
K'ut'aisi (maritime)	42°15' N 42°45' E	147	+2.8°	+24°	14.8°	240.0
Vladikavkaz (N. Caucasian-Continental)	43° 2' N 44°45' E	678[1]	-5.7°	+19°	9.0°	92.0

1 Radó: 747; Rikli: 715. The discrepancy in figures here, as in the cases indicated below, seems to stem from thechoice of different points as bases for measurement.

Climatological Chart..... continued

Place	Position (Lat. N. Long. E.)	Elevation in m.	Average Temperature (centigrade) Jan.	July	Annual	Precipitation (annual) in cm.
Pyatigorsk (N. Caucasian-Continental)	44° 2' N 43° 4' E	516 [2]	-4.9°	+22°	9.4°	54.8
Stavropol' (N. Caucasian-Continental)	45° 2' N 42° E	590 [3]	-4.4°	+20°	8.6°	67.7
Makhach-Kala (N. Caucasian-Continental/Caspian)	40° N 47°30' E	32	-1.3°	+24.6°	11.7°	45.8

2 Radó: 510. 3 Radó: 610.

Climatological Chart.....continued

Place	Position (Lat. N. Long. E.)	Elevation in m.	Average Temperature (centigrade) Jan.	July	Annual	Precipitation (annual) in cm.
Tiflis I (Trans-Caucasian Continental)	41°45' N 44°47' E	458 [4]	-1.0°	+22°	12.7°	47.1
Tiflis II [5] (Trans-Caucasian Continental)		409	+0.1°	+24.2°	12.6°	49.6
Baku I (Trans-Caucasian Continental)	40°25' N 49°50' E	18	+2.4° [6]	24.4° [6]	15.3° [6]	23.8

[4] This is Stieler's figure. Map of 1916 indicates 658.

[5] According to B. P. Alisov, et. al. "Kurs Klimatologii," III, pp. 46 ff; Leningrad, 1954.

[6] Maximal and minimal temperatures taken at Cape Bailov, -8.24 m.

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Climatological Chart.....continued

Place	Position (Lat. N. Long. E.)	Elevation in m.	Average Temperature (centigrade) Jan.	July	Annual	Precipitation (annual) in cm.
Baku II [5] (Trans-Caucasian Continental)	40°21' N 49°51' E	-13	+3.4°	25.2°	13.9°	20.8
Kirovabad(Gandja) (Trans-Caucasian Continental)	40°40' N 46°20' E	442 [7]	?	?	12.9°	20.9
Aralyq (near Ararat) (Trans-Caucasian Continental)	39°53'N 44°30'E	833	?	?	11.4°	15.2

[7] Stieler: 458; Russian Geological Map of 1929: 368 m. at the station of Kirovabad (Gandja).

Climatological Chart.....continued

	Position (Lat. N. Long. E.)	Elevation in m.	Average Temperature (centigrade) Jan.	July	Annual	Precipitation (annual) in cm.
Nor-Bayazet[5] (Trans-Caucasian Continental)	40°20' N 45° 7' E	1965	- 7.8°	16.7°	5.0°	45.3[5]
Shusha (Trans-Caucasian Continental)	39°45' N 46°45' E	1122	?	?	8.0°	52.8
Leninakan (Trans-Caucasian Continental)	40°48' N 43°50' E	1469[8]	-10.7°[5]	18.6°[5]	5.5°[5]	42.7[5]
Abast'umani (Trans-Caucasian Continental)	41°45' N 42°50' E	1300[9]	- 4.6°	18.1°	6.5°	61.8

Climatological Chart footnotes.....continued

8 Stieler: 1548; Map of 1916: 1300; Geological Map of 1929: 1534.
9 Great Soviet Encyclopedia; Radó: 1150; Stieler: 1345.
10 If not otherwise stated, figures are according to E. Reclus (op. cit., p. 73, no. 2), Freshfield, and Rikli.

● 132
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312 Mt. Besh-Tau and the southern slope of a lower Lakkolith mountain, the Zheleznaya ("iron one"), spring from the intrusive rocky layers around the Zheleznaya. There are about 20 warm and cold springs, with temperatures ranging from 15.5° to 55° C, of alkaline-salino-tellurian composition, with a considerable content of carbonic acid, whereas their iron content is very small, not exceeding 5 mg. per l. The springs of Zheleznovodsk combine the qualities of those of Karlsbad and Wildungen.

132 Apart from its wealth of mineral waters of the most various types the entire Besh-Tau area possesses an ideal climate. The average temperature is that of Switzerland and the central Alps but the insolation is more vigorous. The area is protected against northern winds and the humidity is low. It is therefore one of the most healthful spots in the world. The Besh-Tau area has a great number of clear days during the year, so that the higher peaks always afford a most magnificent view of Mt. Elbrus and neighboring peaks of the central Caucasus.

312 In the Groznyi area, well known for its oil wells and the corresponding industry, the hot springs of Goriachevodsk — "hot waters" — now Goriacheistochnenskaya — should be mentioned. They are situated at 212 m. above sea level, 15 km. north of Groznyi, near Staryi Yurt. The temperature of the springs approaches the boiling point, being 80° - 81° and 92° - 95° C. The springs contain only a small

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SU 133 and glaciers. Here Mt. El'brus and Mt. Kazbek (16,541 feet), two extinct volcanoes, are evidence of the considerable volcanic activity which C 133 accompanied the folding processes. In this portion of the Greater Caucasus rise the Terek River, in the north, and the Rion River, in the south. East of Mt. Kazbek the main divide is formed primarily of Jurassic beds and nowhere exceeds 14,750 feet. The glaciers gradually decrease in size. They disappear altogether near the Caspian Sea, where the Greater Caucasus becomes a low range of hills rising to 1,075 feet. The northern spurs of this section of the Caucasus form an extensive mountain region known as Dagestan. The chief rivers here are the Sulak in the north and in the south the left affluents of the Kura River.

The Kuban' and the Terek are the main rivers of the Northern Caucasus. Due to their mountain origin, high water occurs in the summer when snow and ice melt in the high altitudes. The force of the current washes out the upper valleys, and in depositing the sediments in the lower course it forms sand banks, which render these streams useless for navigation. They are, however, important for irrigation and as a source of hydroelectric power. In their lower reaches these rivers form large swampy deltas, with many lakes and channels, overgrown with reeds and other marsh vegetation. The large quantities of sediment SU carried by the Terek act to enlarge the delta from year to year.

132 The climate of the Northern Caucasus is of the continental type and C is exposed to a series of opposing air mass movements from the west, 132 bringing moisture from the Black Sea and from the east, where they originate in the dry desert regions of Central Asia. Although the winters are short, they are severe, and frosts of below 0° F occur frequently. Spring arrives at the end of February and soon turns into a hot summer. Most of the precipitation occurs in the summer and is greater in the west and in the high altitudes. The heaviest rainfall takes place on the southern slopes of the Greater Caucasus near the Black Sea (up to 25 inches yearly); in the Kuma-Manych Depression to the northeast, precipitation is less than 12 inches a year. The climate of the Greater Caucasus range, while it varies, depending on the elevation and the location, is marked by a steady decrease of precipitation from west to SU east.

131 In accordance with the amount of precipitation, the type of vegeta- C tion varies throughout the region. The western ranges are covered with 137 deciduous forests, with oak and beech, while the eastern highlands of Dagestan are nearly treeless. At lower altitudes begins the oak forest

The Donets ridge, the major portion lying within the Ukraine, penetrates the oblast between the lower Don and its right affluent, the Northern Donets. It is a plateau of limestone and sandstone, which is deeply dissected by river courses and ravines. On the higher points burial mounds of the ancient steppe dwellers are often found. The villages, normally surrounded by gardens and orchards, lie along the ravines and valleys of small streamlets. A similar landscape is represented by the outliers of the Central Russian upland to the north. The Don steppe, on the contrary, constitutes very level terrain. The wide river valleys, where streams proceed with a sluggish current, are often filled with salt lakes, and salt flats frequently break the expanse of black-earth and chestnut soils which characterize the region. Toward the east the relief gradually merges with the features of the Caspian lowland.

Normally the Don is not a very abundant river, but spring freshets raise its level considerably. At its mouth, on the Taganrog Gulf of the Sea of Azov, it forms a large delta, which, together with the shallow waters of the adjoining sea, abounds in fish of many varieties.

The climate is continental, with hot summers and severe, snowless winters. Precipitation varies from 16 inches annually in the west to 12 inches in the east and occurs chiefly in the summer months, in frequent heavy downpours. Easterly prevailing winds blowing in the spring and summer from the dry steppes and deserts of Central Asia and Kazakhstan present a serious danger of drought to the crops. Drought conditions are especially marked in the southeast, along the Sal River, where black earth is largely replaced by chestnut soils. In the well-watered flood plain of the lower Don, alluvial pastures are important for the raising of dairy cattle.

The eastern wing of the Donets Basin penetrates into the oblast along the Northern Donets River. Anthracite predominates in this area and represents about one fifth of the total reserves of the basin. The major coal-mining centers are Shakhty and Novoshakhtinsk. Other coal mines are concentrated in the areas of Gukovo, north of Krasnyy Sulin, and Gundorovka, west of Kamensk-Shakhtinskiy. In the Bogurayev coal field, at the intersection of the Northern Donets River and the Likhaya-Stalingrad railroad, coal is mined at Koksovyy (characteristically named for coke) north of the railroad and at Sinegorskiy to the south. Belaya Kalitva, at the center of this field, has limestone and glassworks. Anthracite dust from the mines is used to feed the power station of Artemovskiy, an eastern suburb of Shakhty, and the Nesvetay station

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133 rise above 10,000 feet only in the southern section. Volcanism plays an
C important role in this region. There are a number of extinct volcanoes,
133 including the 13,500 feet high Mount Aragats (or Alagez). The greater part of the Armenian plateau is covered with extrusive volcanic rocks, including eroded basaltic formations. Mineral springs occur throughout the area, and destructive earthquakes often create great havoc; the most recent disaster was in 1926 at Leninakan.

The Rion River basin faces the Black Sea. Its lowest section along the coast is known as Kolkhida (ancient Colchis); it consists largely of marshes and lagoons. Recently this area has been the site of a large reclamation-drainage project. The Kura River basin, which includes the major part of eastern Transcaucasia, is a large alluvial plain drained by the Kura and the Aras (Russian *Araks*) rivers. It is essentially a sterile steppe in the central section, punctuated by occasional salt flats and changing into more fertile black earth on the lower slopes
SU of the northern and southern highlands.
132 The Rion lowland has a humid subtropical climate, with a warm
C winter—the January average at Batumi is 43° F—a hot, humid sum-
●132 mer, and a very heavy rainfall (100 inches a year at Batumi). Precipitation occurs chiefly in the summer, when moisture-laden winds blow from the Black Sea. This circumstance makes the local climate unlike the Mediterranean type, and classifies it rather with the monsoon climates of East Asia (Japan and southern China). The winters are extremely mild along the Black Sea coast; occasionally there are frosts in January, but they are not severe and are of short duration.

Eastern Transcaucasia, including the Kura lowland, has a more continental climate, due principally to the barrier of the Surami range, which bars the warm Black Sea winds from this area. The winters are rather warm, but frosts occur more often, and temperatures drop lower than in the west. Summer is hot, and there is much less precipitation (about 15 inches) than on the Black Sea. In the extreme southeast the Lenkoran' lowland at the foot of the Talysh range again has a humid subtropical climate. The Talysh range condenses the humid Caspian Sea air and produces considerable precipitation in the coastal plain.

The Armenian plateau, in the south, has a continental climate. The local winters are as cold there as in the northern half of the European USSR. At Yerevan (elevation: 3,300 feet), frosts are as low as —13° F, and in July temperatures rise to 104° F. The amount of rainfall varies

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in the various sections; generally it is less than 12 to 14 inches a year, necessitating irrigation methods in the low-lying Aras valley.

Vegetation types throughout Transcaucasia vary in accordance with the predominant climate. Along the Black Sea coast the high temperatures and humidity lead to the development of a very luxurious and dense vegetation, forming nearly inaccessible jungles in some sections. The trees, which are largely of Western and Central European origin, reach an exceptionally large size. In spite of the vegetation cover, there is much erosion in this area and the streams are very muddy. Among the most common garden plants are magnolia, cactus, eucalyptus, tangerine, orange, lemon, olive, tea, bamboo, and assorted palms. The dry steppe vegetation of eastern Transcaucasia, with its salt flats and a meager plant cover (consisting chiefly of wormwood, saltwort, and thorny bushes), is in sharp contrast to the small subtropical zone in the Lenkoran' lowland, where the very hard and dense ironwood is most important. The ranges and gorges in the Armenian plateau are covered with deciduous trees; the steppes on the plateau have a rather rich grass cover. In addition to animals commonly found in the Greater Caucasus, the fauna of Transcaucasia includes Mediterranean and Iranian species such as the porcupine and the dzheyran-antelope, and in the steppes, numerous rodents. In the Talysh range leopards and occasionally hyenas and tigers are encountered. Along the Lenkoran' littoral there are many aquatic birds for which a reserve has been created at Kizyl-Agach.

The population of Transcaucasia belongs to a large number of ethnic groups. The Georgian group includes the Georgians proper, and many smaller related nationalities, such as Svans, Khevsurs, Pshaves, Imeretians and Adzhars; the Iranian group comprises the Ossetians, the Kurds, and the Talysh people, and the Abkhaz form a branch of the Caucasian group. The Georgians and the Armenians are the most numerous. Eastern Transcaucasia is settled by the Azerbaijan people of the Turkic group, who migrated to this area from the northeast from beyond the Caspian Sea.

The total population of Transcaucasia (about 8,100,000 people) is distributed quite irregularly, due to relief and climatic factors. Most sparsely settled are the Greater and the Lesser Caucasus ranges and the dry steppes in the eastern sections, while the Black Sea littoral of the Georgian SSR and the Rion valley show the greatest population density.